

REMARKS

Claims 1-4, 10 and 14-16 are pending in this application. By this Amendment, claim 1 is amended. Support for amended claim 1 can be found, for example, at page 9, lines 20-21. No new matter is added.

I. Claim Rejections Under 35 U.S.C. §103

A. EP '817 and AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over EP 0849817 ("EP '817") in further view of Applicants' alleged admission of prior art ("AAPA"). Applicants respectfully traverse the rejection.

1. The Amorphous Phase of the Oxide

By this Amendment, claim 1 recites "the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0." EP '817 and the AAPA, alone or in combination, do not teach or suggest at least these claim features.

The newly added claim feature of the amount of the amorphous phase of the oxide is an important feature of the claimed invention. As discussed in the present specification, when the amount of the amorphous phase of the oxide is greater than 0.01 mol, the discharge capacity in the Li secondary battery can decrease. Thus, it is necessary for an amorphous phase of an oxide to be present within a particle of a material powder of the claimed invention or at the surface thereof. See specification at page 9, line 20 - page 10, line 2, and claim 1.

On the other hand, EP '817 teaches a lithium-containing amorphous nickel oxide that is represented by the chemical composition of formula $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}_z\text{O}_2$, wherein M is at least one of Mn, Al, P, B and S, and z is greater than 0 and less than 1. See EP '817 at page 3,

line 56 - page 4, line 6. The amount of the amorphous phase of the oxide in claim 1 is substantially smaller than the possible amount of amorphous phase of the oxide disclosed in the reference, because the claimed amount of 0.01 mol ratio but no more than 0 is substantially smaller than the disclosed range of less than 1. As described in the present specification, an amorphous phase of an oxide that is composed of at least one element selected from the group consisting of Na, K, Si, P and Al must be in a quite limited range of less than 0.01 against the total amount of mols of Ni and Co because the amorphous phase of the oxide in an amount in excess of 0.01 mol may cause a reduction in discharge capacity.

See specification at page 9, line 20 - page 10, line 2.

Therefore, one of ordinary skill in the art would not have prepared the amorphous phase of the oxide containing at least one element selected from the group consisting of Na, K, Si, P and Al, wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed, from EP '817. This is at least because EP '817 does not teach or suggest that the amorphous phase of the oxide must be in the limited claimed range of less than 0.01 mol ratio but more than 0.

The AAPA does not cure the deficiencies of EP '817. The AAPA does not teach or suggest that the amorphous phase of the oxide containing at least one element selected from the group consisting of Na, K, Si, P and Al, wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed.

Furthermore, neither EP '817 nor the AAPA provide any reason or rationale for one of ordinary skill in the art to have prepared the claimed positive electrode material powder for lithium secondary battery, wherein the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al, wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed. As a result, claim 1 would not have been obvious in view of EP '817 and the AAPA.

2. The Amount of Ba

Claim 1 also recites the feature "the amount of Ba in a system component is 0.005 to 0.01 mol ratio." The Office Action acknowledges that EP '817 does not explicitly disclose the Ba component. See Office Action at page 4, lines 17-18. However, the Office Action asserts that the AAPA presents different publications teaching positive electrode materials for lithium secondary batteries wherein the positive electrode material has a Li-Ni-Co-Ba-O system composition wherein the amount of Ba is 0 to 0.10 mol ratio. See Office Action at page 4, line 19 - page 5, line 3, and specification at page 1, line 14 - page 2, line 7.

The Office Action argues that by combining the teachings of the prior art, it would have been obvious to a person possessing a level of ordinary skill in the print art at the time the invention was made to have added the Ba component of the AAPA to the amorphous positive electro material of EP '817 because it is known in the art that Ba allows easy formation of the amorphous phase of the oxide. Applicants respectfully disagree.

The Office Action attempts to use the Applicants' own invention as admitted prior art and then attempts to reason what was known in the art based on Applicants' disclosure. Thus, the Office Action impermissibly uses Applicants' disclosure as a road map for combining the references and finding obviousness. Specifically, Applicants' disclosure that a constituent component of the amorphous phase of the oxide in the present invention is composed of an oxide of one or a plurality of elements selected from the group consisting of Na, K, Si, P and Al, which allows easy formation of the amorphous phase of the oxide, is not an admission of prior art but is a part of Applicants' disclosure. Therefore, the Office Action's use of Applicants' disclosure to provide a reason or rationale for why one of ordinary skill in the art would recognize that it would improve similar materials or products in the same way by using known techniques is an improper combination based upon a hindsight analysis. Accordingly, claim 1 would not have been obvious over EP '817 in view of the AAPA.

As EP '817 and the AAPA, alone or in combination, fail to teach or suggest each and every feature of claim 1, and the Office Action fails to provide an appropriate reason or rationale for why one of ordinary skill in the art would have produced the positive electrode material powder for a lithium secondary battery of claim 1, claim 1 would not have been rendered obvious by EP '817 and the AAPA. Claims 2-4, 10 and 14-16 variously depend from claim 1 and, thus, also would not have been rendered obvious by EP '817 and the AAPA. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. JP '277 and AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over JP 06-275277 ("JP '277") as applied to claim 1 and further in view of AAPA. Applicants' respectfully traverse the rejection.

By this Amendment, claim 1 recites "the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0." JP '277 and the AAPA, alone or in combination, do not teach or suggest at least these claim features.

JP '277 discloses a composite oxide containing lithium used for a lithium secondary battery where a mol ratio of phosphorous is in excess of 0.2 mols against that of lithium. See JP '277 at paragraph [0009]. Thus, JP '277 teaches a substantially larger mol ratio of the amorphous phase of the oxide than the claimed amount of "less than 0.01 mol ratio but more than 0."

The AAPA does not cure the deficiencies of JP '277, because the AAPA does not teach or suggest that the amorphous phase of the oxide containing at least one element

selected from the group consisting of Na, K, Si, P and Al, wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed.

Further, neither JP '277 or the AAPA provide any reason or rationale for one of ordinary skill in the art to have prepared the claimed positive electrode material powder for lithium secondary battery, wherein the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed. The only possible reason or rationale comes only from Applicants' own disclosure, which is improper for all of the reasons discussed above.

As neither JP '277 nor the AAPA, alone or in combination, teach or suggest "the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0," claim 1 would not have been rendered obvious by JP '277 and the AAPA. Claims 2-4, 10 and 14-16 variously depend from claim 1 and, thus, also would not have been rendered obvious by JP '277 and the AAPA. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Kobayashi and AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over Kobayashi et al. (U.S. Patent Application Publication No. 2002/0055041, "Kobayashi") as applied to claim 1 above and further in view of AAPA. Applicants respectfully traverse the rejection.

By this Amendment, claim 1 recites "the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0." Kobayashi and the AAPA, alone or in combination, do not teach or suggest at least these claim features.

Kobayashi discloses an active material that has at least an amorphous phase and the elements Na, K, Si, P and Al, but Kobayashi does not teach that the amorphous phase of the

oxide is less than 0.01 mol ratio but more than 0, as claimed. Further, Kobayashi does not provide a reason or rationale for one of ordinary skill in the art to have prepared the claimed positive electrode material powder for lithium secondary battery, wherein the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed.

The AAPA does not cure the deficiencies of Kobayashi, because the AAPA does not teach or suggest that the amorphous phase of the oxide containing at least one element selected from the group consisting of Na, K, Si, P and Al, wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0, as claimed. Further, the AAPA does not provide any reason or rational reason or rationale for one of ordinary skill in the art to have prepared the claimed positive electrode material powder for lithium secondary battery.

As Kobayashi and the AAPA, alone or in combination, do not teach or suggest the amount of the amorphous phase oxide is less than 0.01 mol ratio but more than 0, as claimed in claim 1, claim 1 would not have been rendered obvious by Kobayashi and the AAPA. Claims 2-4, 10 and 14-16 variously depend from claim 1 and, thus, also would not have been rendered obvious by Kobayashi and the AAPA. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-4, 10 and 14-16 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Andrew B. Freistein
Registration No. 52,917

JAO:ABF/kxs

Attachment:

Petition for Extension of Time

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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